REVISIONS

LT	DESCRIPTION	DATE	APPROVED
A	Changed manufacturer's eligibility.	24 Aug 1987	Steven B. Searcy
B	Cancel Document	3 Mar 2000	Kendall A. Cottongim

Notice of Cancellation

DESC Drawing 84178, dated 16 August 1985 is hereby canceled. No superseding document.

Prepared in accordance with MIL-STD-100

Selected item drawing

REV																						
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REV STATUS OF PAGES	**REV**			B																		
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PMIC N/A	**PREPARED BY** Richard A.Yannitti	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing 16 August 1985	**CHECKED BY** James R. Martin	**TITLE** RELAYS, SOLID STATE, OPTICALLY ISOLATED, 5 AMPERE LOAD AT 50 V DC
	APPROVED BY Steven B. Searcy	
	SIZE A / **CODE IDENT. NO.** 14933	**DWG NO.** 84178
	REV B	**PAGE** 1 **OF** 9

AMSC N/A

5945-E090

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing establishes the complete requirements for a sealed solid state relay supplied to "Y" screening requirements of MIL-R-28750.

1.2 Part number. The complete part number shall be as shown in the following example:

84178	-001
Drawing number	Dash number (see figure 1)

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-R-28750 - Relays, Solid State, General Specification For.

STANDARD

MILITARY

MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-R-28750, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-R-28750, and herein (see figure 2).

3.3. Input characteristics.

3.3.1 Control voltage range.

DC input (-001, -002): 3 V dc minimum to 32 V dc maximum.

AC input (-003): 90 V ac minimum to 250 V ac maximum.

3.3.2 Turn on voltage.

DC input (-001,-002): 3 V dc minimum.

AC input (-003): 90 V ac minimum, 60 Hz.

3.3.3 Turn off voltage.

DC input (-001, -002): 0.8 V dc.

AC input (-003): 20 V ac, 60 Hz.

3.3.4 Input current (see figure 3).

DC input (-001, -002) at 5 V dc: 5.5 mA maximum.

DC input (-001, -002) at 32 V dc: 36 mA maximum.

AC input (-003): 25 mA rms at maximum control voltage.

3.3.5 Control voltage frequency (-003 only). 47 to 70 Hz.

3.3.6 Turn-on time delay.

-001: 25 microseconds maximum.

-002: 100 microseconds maximum.

3.3.7 Turn-off time delay.

-001: 100 microseconds maximum.

-002: 2 milliseconds maximum.

3.3.8 Rise time.

-001: 75 microseconds maximum.

-002: 2 milliseconds maximum.

3.3.9 Fall time.

-001: 200 microseconds maximum.

-002: 145 microseconds maximum.

3.3.10 Turn-on time (-003 only). 25 milliseconds maximum.

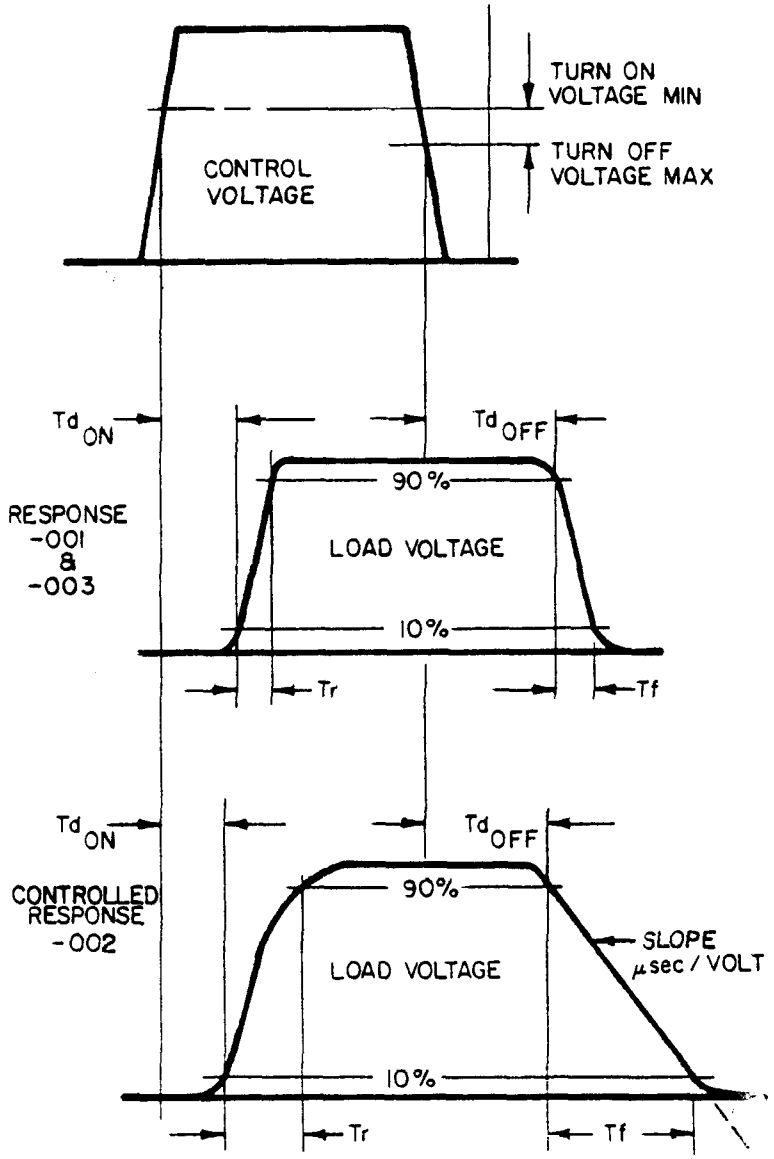
3.3.11 Turn-off time (-003 only). 25 milliseconds maximum.

3.4 Output characteristics.

3.4.1 Output current rating (resistive load). 5 amperes (see figures 3 and 4).

3.4.2 Load voltage rating. 3 to 50 V dc.

3.4.3 Voltage drop at maximum current. 1.5 V dc maximum.



NOTE: Relay mounted with silicone grease on heat sink.

FIGURE 1. Response curves.

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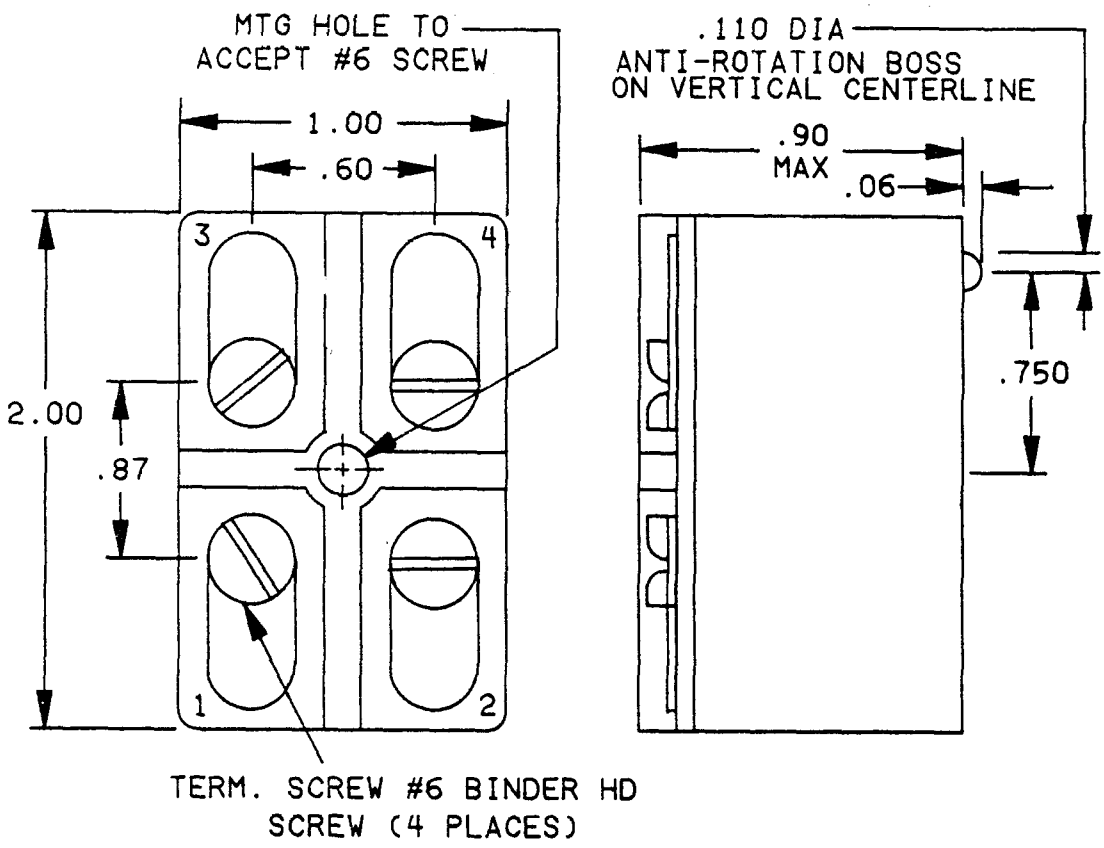

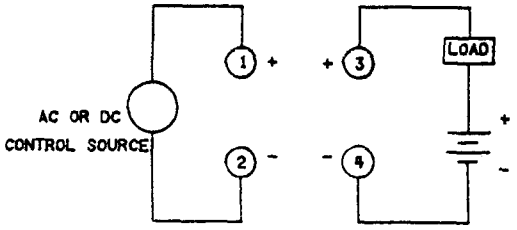

Circuit diagram terminal view

Inches	mm
.06	1.5
.110	2.79
.60	15.2
.750	19.05
.87	22.1
.90	22.9
1.00	25.4
2.00	50.8

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.005 (0.13 mm) for three place decimals and ±.01 (0.3 mm) for two place decimals.
4. Circuit diagram shown on part is terminal view.

FIGURE 2. Outline dimensions and configuration.

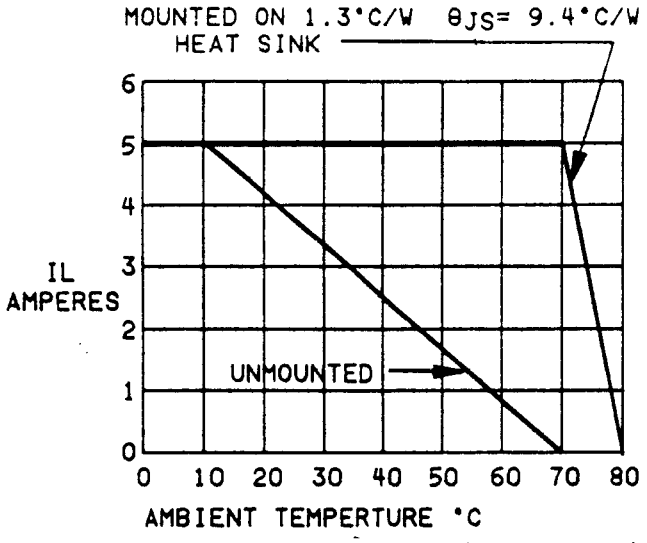

FIGURE 3. DC relay derating curve (-001 and -002).

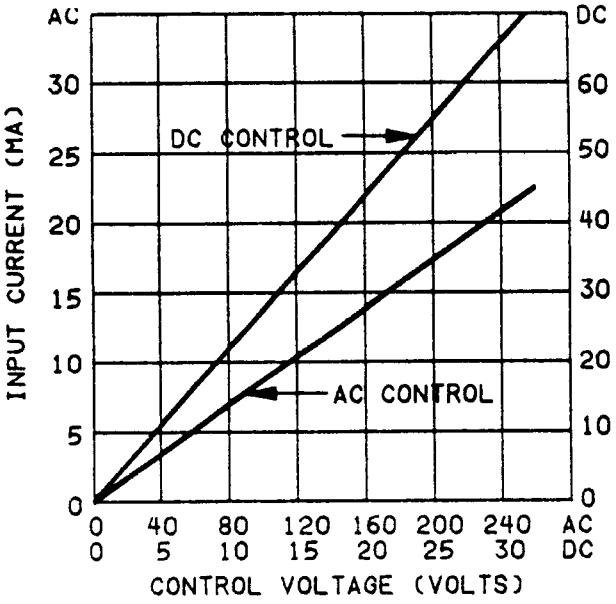

FIGURE 4. Input current vs. control voltage (typical) all units.

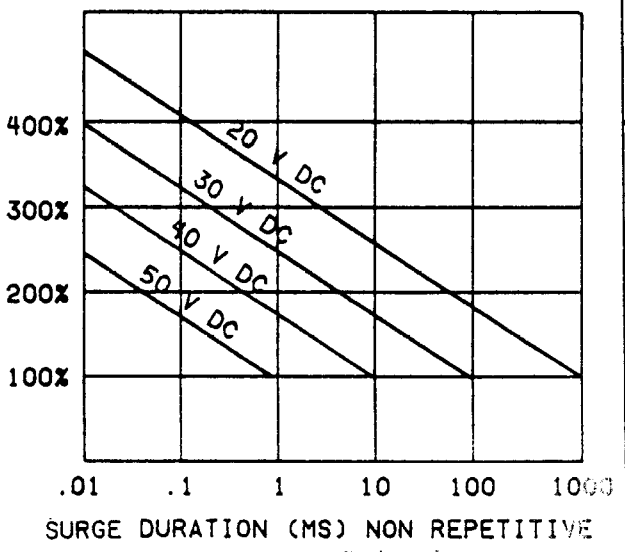

FIGURE 5. Maximum allowable overloading as a function of supply voltage.

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3.4.4 Surge current. See figure 5.

3.4.5 Output leakage current. 15 mA dc maximum.

3.5 Electrical characteristics.

3.5.1 Isolation.

Input to output Input to case Output to case	1,000 megohms minimum.

3.5.2 Capacitance. Input to output: 20 picofarads.

3.5.3 Dielectric strength.

Input to output Input to case Output to case	1,500 V rms minimum.

3.5.4 Reverse voltage protection (dc control). 32 V dc maximum.

3.5.5 Power dissipation factor. 1.5 watts per ampere maximum.

3.5.6 Power junction temperature. 150°C.

3.5.7 Transient voltage. Not applicable.

3.5.8 Electromagnetic interference. Applicable.

3.5.9 Exponential rate of voltage rise (dv/dt). Not applicable.

3.6 Environmental data.

3.6.1 Operating temperature range. -30°C to +80°C.

3.6.2 Storage temperature range. -30°C to +80°C.

3.6.3 Shock. MIL-STD-202, method 213, test condition G (50 G).

3.6.4 Vibration. MIL-STD-202, method 204, test condition D (20 G, 10 to 2,000 Hz).

3.7 Physical. Physical requirements shall be as specified herein.

3.7.1 Weight. 85 grams (3 ounces) maximum.

3.7.2 Dimensions and configuration. See figure 5.

3.8 Marking. Marking shall be in accordance with MIL-R-28750 except the part number shall be in accordance with 1.2 herein. The "M28750/X-XXXY" part number shall not be used.

3.9 Quality assurance requirements. Relays furnished under this drawing shall have been subjected to, and passed all the requirements, tests, and inspections detailed herein.

3.9.1 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-R-28750 and 4.2 herein.

3.10 Certification as an approved source of supply. In order to be listed as an approved source of supply for relays manufactured to this drawing, a manufacturer shall:

a. Agree to make available to DESC, upon request, all pertinent test data on its production of the subject part, including, but not limited to, test data in accordance with the qualification inspection table of MIL-R-28750, Y screening level; and

b. Provide to DESC-EMD or its designated agent, upon request, free of charge and without obligation, a current production sample from its production of the subject part; and

c. Meet one of the following criteria:

(1) Currently possess listing on qualified products list QPL-28750 for at least one part; or

(2) Be in current production of the subject part.

3.10 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.6 and 6.7).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-R-28750, except as modified herein.

4.2 Quality conformance inspection. Quality conformance inspection shall be in accordance with group A listing of MIL-R-28750. Group A testing shall be performed on each inspection lot and manufacturers shall keep lot records for 3 years (minimum), monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these relays.

4.2.1 Group A inspection. Group A inspection shall consist of all tests specified in MIL-R-28750 for the "Y" screening level except internal components used internally to the relay shall not require hermetic packaging. Temperature range shall be as specified in 3.6.1.

4.2.1.1 Seal. Hermetic seal testing is not applicable.

4.3 Inspection of packaging. Inspection of packaging shall be in accordance with MIL-R-28750.

5. PACKAGING.

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-R-28750.

6. NOTES

6.1 Notes. Only definitions of the notes specified in MIL-R-28750 shall apply to this drawing.

6.2 Intended use. Relays conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-28750; this drawing will become inactive for new design. The QPL-28750 product shall be the preferred item for all applications.

6.3 Ordering data. The acquisition document should specify the following:

a. Complete part number (see 1.2).

b. One copy of the quality conformance inspection data as required in 4.2 to be shipped with each lot.

c. Requirements for packaging and packing.

6.4 Replaceability. Relays covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.5 Comments. Comments on this drawing should be directed to DESC-EMD, Dayton, Ohio 45444, or telephone 513-296-6184.

6.6 Submission of certificate of compliance. The certificate of compliance submitted to DESC-EMD, prior to listing as an approved source of supply, shall state that the manufacturer's product meets the requirements herein.

6.7 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.11) has been submitted to DESC-EMD.

DESC drawing part number 87178-	Vendor CAGE number	Vendor similar part number
001	63745	M03-2
002	"	M03-22
003	"	M03-12

Vendor CAGE number	Vendor name and address
63745	Teledyne Solid State Products 12525 Daphne Avenue Hawthorne, CA 90250